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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,262	06/30/2005	Pierre Barberis	12467/5	6616

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EXAMINER	
SHEVIN, MARK L	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,262	BARBERIS ET AL.	
	Examiner	Art Unit	
	Mark L. Shevin	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 6-20, filed April 4th, 2008, are pending. Claims 1-5 were cancelled, claim 9 is amended, and claims 11-20 are new.

Status of Previous Rejections

2. **Claims 6-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Charquet** (US 5,674,330). The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Regarding claims 6-8 and 10, these claims, as previously presented, are rejected on the same grounds as stated in the previous Office Action mailed November 13th, 2007.

With respect to the amendment to claim 9, adding "at most", Charquet teaches that his process relates to the production of a flat product (sheet) using a zirconium alloy with 0.1 – 0.4 % Fe, 0.5 - 2.0% Sn, 0 – 0.1% Ni, 0.055 – 0.2% Cr, and impurities (col. 4, lines 55-61). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

Charquet has been extended to new claims 11-20 as described below:

Regarding claims 11 and 12, with respect to the additional features of "selecting a temperature for forging in the α and β phase as a function of the composition of the zirconium alloy", Charquet discloses (col. 4, lines 55-60) the production of an ingot by casting a Zr alloy containing at least 97% Zr, then forging the same at a temperature

between 700 and 1000°C, i.e. a temperature at which said Zr alloy may be in a state comprising crystalline phases alpha and beta of said Zr alloy, in order to produce a prefabricated product (blank or semi-finished product) with only one forging operation envisaged in the method (col. 4 line 65 to col. 5, line 32 and Fig. 1).

Charquet does not teach the specific size of the ingot, however one of ordinary skill would be able to alter the size of the ingot produced through routine optimization. Where the only differences between the prior art and the instant claims are relative dimensions and the article having the claimed relative dimensions would not performed differently than the prior art device, the claimed articles is not patentably distinct from the prior art article. However, per the rejection used in claim 10, Charquet teaches that zirconium sheet in the size range of 0.8 - 3.5 mm are known in the prior art as fuel elements casings for nuclear reactors (col. 1, lines 13-21). Given that Charquet discloses subsequent hot and cold rolling of a zirconium alloy blank (flat product), Charquet clearly envisions a flat product with a thickness in the claimed range. Furthermore, one of ordinary skill could alter the size of the flat product produced through routine optimization.

As stated in the previous rejection of claims 7-8 and 10, the temperature range at which a given zirconium alloy will contain both the alpha and beta phase will vary depending on the alloy composition and the temperature range can be selected by routine optimization depending on the alloy use. Thus selecting the forging temperature for forging in the alpha and beta range is implied from the third (previously presented) step of "forging the ingot of the semi-finished product...single forging operation at a

temperature at which the zirconium alloy is in a state comprising the crystalline α and β phases of the zirconium alloy" and thus the overall process, including the new temperature selection step, would have been obvious to one of ordinary skill in the metallurgical arts, at the time the invention was made, as Charquet discloses a single forging temperature range that overlaps the claimed alpha+beta range. Motivation to select the alpha+beta range flows from the ever-present desire of one of ordinary skill to optimize within known ranges to find the best outcome through routine experimentation.

Similarly, with respect to claim 12 in particular, given that one of ordinary skill determines the alpha+beta phase field (which is within the Charquet temperature range) as a result of optimization, this implicitly excludes allowing the forging to occur where the sole phase in the beta phase.

Regarding claims 13 and 18, as stated in the previous Office Action, the temperature range at which a given zirconium alloy will contain both the alpha and beta phase will vary depending on the alloy composition, and the temperature range can be selected by routine optimization depending on the alloy used.

Regarding claims 14 and 17, as stated in the previous Office Action, the amount of alpha phase present in the billet during forging can be easily optimized through routine optimization and by consulting a phase diagram that is well known to metallurgists. The temperature range at which a given zirconium alloy will contain both the alpha and beta phase will vary depending on the alloy composition, and the temperature range can be selected by routine optimization depending on the alloy used.

Regarding claims 15 and 19, as stated earlier in this Office Action, Charquet teaches that his process relates to the production of a flat product (sheet) using a zirconium alloy with 0.1 – 0.4 % Fe, 0.5 - 2.0% Sn, 0 – 0.1% Ni, 0.055 – 0.2% Cr, and impurities (col. 4, lines 55-61). MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" *a prima facie* case of obviousness exists."

Regarding claims 16 and 20, per the rejection used in claim 10, Charquet teaches that zirconium sheet in the size range of 0.8 - 3.5 mm are known in the prior art as fuel elements casings for nuclear reactors (col. 1, lines 13-21). Given that Charquet discloses subsequent hot and cold rolling of a zirconium alloy blank (flat product), Charquet clearly envisions a flat product with a thickness in the claimed range. Furthermore, one of ordinary skill could alter the size of the flat product produced through routine optimization.

3. **Claims 6-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sabol** (EP 0.085.552).

Regarding claims 6-8 and 10, these claims, as previously presented, are rejected on the same grounds as stated in the previous Office Action mailed November 13th, 2007.

With respect to the amendment of claim 9, adding "at most" Sabol's invention relates to Zircalloy alloy products which contain 1.2 – 1.7% Sn, 0.04 - 0.20 Fe, and 0.05-0.15 Cr (p. 1, lines 8-20). MPEP 2144.05, para I states: "In the case where the

claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

Sabol has been extended to new claims 11-20 as described below:

Regarding claims 11 and 12, Sabol, in his background section, teaches it is known in the prior that nuclear grade Zircaloy (Zr-Sn) alloy products are made by producing an ingot having a diameter between 16 and 25 inches, which corresponds to between 406 and 635 mm respectively. The ingot is then heated into the beta, *alpha+beta*, or high temperature alpha phase and then worked to some intermediate sized and shaped billet (page 2, lines 5-12). This working step may be performed by forging (page 2, lines 12-13).

Overall, Sabol teaches that after a first step of producing an ingot, and then forging this ingot to produce a semi-finished product (intermediate billet, page 2, line 14). Sabol envisages the option of having a single forging step (page 2, lines 12-19; page 4, lines 6-13).

Sabol does not teach the specific claim limitations involving the length of the ingot or the size of the semi-finished product produced by a single forging operation, however one of ordinary skill would be able alter the size of the ingot and semi-finished product through routine optimization.

With respect to the additional features of "selecting a temperature for forging in the α and β phase as a function of the composition of the zirconium alloy", motivation to select the alpha+beta range flows from the ever-present desire of one of ordinary skill to

optimize within known ranges to find the best outcome through routine experimentation combined with Sabol's suggestion to forge in that range.

The claimed invention, taken as a whole, would have been obvious to one of ordinary skill in the art at the time the invention was made in view of the teachings of Sabol. Furthermore, there are repeated references to later operations as being adjustable or tailored to the size and shape of the ingot billet (page 2, lines 29-35).

Regarding claims 13 and 18, as stated in the previous Office Action, the temperature range at which a given zirconium alloy will contain both the alpha and beta phase will vary depending on the alloy composition, and the temperature range can be selected by routine optimization depending on the alloy used.

Regarding claims 14 and 17, as stated in the previous Office Action, the amount of alpha phase present in the billet during forging can be easily optimized through routine optimization and by consulting a phase diagram that is well known to metallurgists. The temperature range at which a given zirconium alloy will contain both the alpha and beta phase will vary depending on the alloy composition, and the temperature range can be selected by routine optimization depending on the alloy used.

Regarding claims 16 and 20, Sabol further teaches that where a final material of a rectangular cross section (flat product) is desired additional reductions (rolling) may be performed. The Examiner infers from this that additional rolling operations can be performed on the slab (billet) to yield a flat product of any given dimension. One of ordinary skill could alter the size of the flat product produced through routine optimization. Furthermore, Sabol teaches that the zirconium alloys (Zircaloy) mentioned

in Sabol's specification, were initially developed as cladding materials for nuclear components (nuclear fuel assembly), see page 1, lines 8-10.

4. The previous rejections of claims 6 and 10 on the grounds of nonstatutory obviousness-type double patenting over claims 11-13 and 18 of copending Application 10-541,774 **have been withdrawn** in view of Applicant's comments at p. 9, para 3-5.

Response to Applicant's Arguments:

5. Applicant's arguments filed April 4th, 2008 have been fully considered but they are not persuasive.

Applicants assert that Charquet does not teach forging in the alpha and beta phase field because Charquet teaches a wide temperature range that largely cover purely alpha and purely beta domains.

In response, MPEP 2144.05 (I - para 1) states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists." Furthermore, MPEP 2144.05 (I - para 2) states: "[A] prior art reference that discloses a range encompassing a somewhat narrower claimed range is sufficient to establish a prima facie case of obviousness." Lastly, MPEP 2144.05 (II, A, para 1) states: Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

Applicants assert that Charquet does not teach or disclose the size of the ingot. In response, as stated above, one of ordinary skill would be able to alter the size of the ingot produced through routine optimization. Where the only differences between the prior art and the instant claims are relative dimensions and the article having the claimed relative dimensions would not performed differently than the prior art device, the claimed articles is not patentably distinct from the prior art article.

Applicants assert that claims 7 and 8 are not taught and in response the Examiner has already rejected claims 7 and 8 twice and maintains that the amount of alpha phase present in the billet during forging can be easily optimized through routine optimization and by consulting a phase diagram that is well known to metallurgists. The temperature range at which a given zirconium alloy will contain both the alpha and beta phase will vary depending on the alloy composition, and the temperature range can be selected by routine optimization depending on the alloy used.

Applicants next assert that Sabol does not teach forging in the alpha and beta phase field and does not imply forging of a slab of 100 mm thickness.

In response, motivation to select the alpha+beta range flows from the ever-present desire of one of ordinary skill to optimize within known ranges to find the best outcome through routine experimentation combined with Sabol's suggestion to forge in that range. Although Sabol did not teach the specific claim limitations involving the length of the ingot or the size of the semi-finished product produced by a single forging operation, however one of ordinary skill would be able alter the size of the ingot and semi-finished product through routine optimization. Where the only differences between

the prior art and the instant claims are relative dimensions and the article having the claimed relative dimensions would not performed differently than the prior art device, the claimed articles is not patentably distinct from the prior art article.

Applicants' assertions with respect to the Double patenting provisional rejections are moot in view of the withdrawal of these rejections as explained at p. 8, *supra*.

Pertinent Prior Art

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Barberis US 2008/0080660 A1

Barberis US 2007/0053476 A1

Barberis US 2006/0215806 A1

Barberis US 2006/0090821 A1

Van Swam US 5,854,818

Van Swam US 5,844,959

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

-- Claims 6-20 are finally rejected
-- No claims are allowed

The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588. The examiner can normally be reached on Monday - Thursday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Mark L. Shevin/
Examiner, Art Unit 1793
/Roy King/
Supervisory Patent Examiner, Art Unit 1793

July 7th, 2008
10-541,262